Bottom Image
Side Scan Sonar Mapping

Captain Barry Cullens

Presentation to

Currituck

Sound Project Data

Collection Meeting

Side Scan Sonar

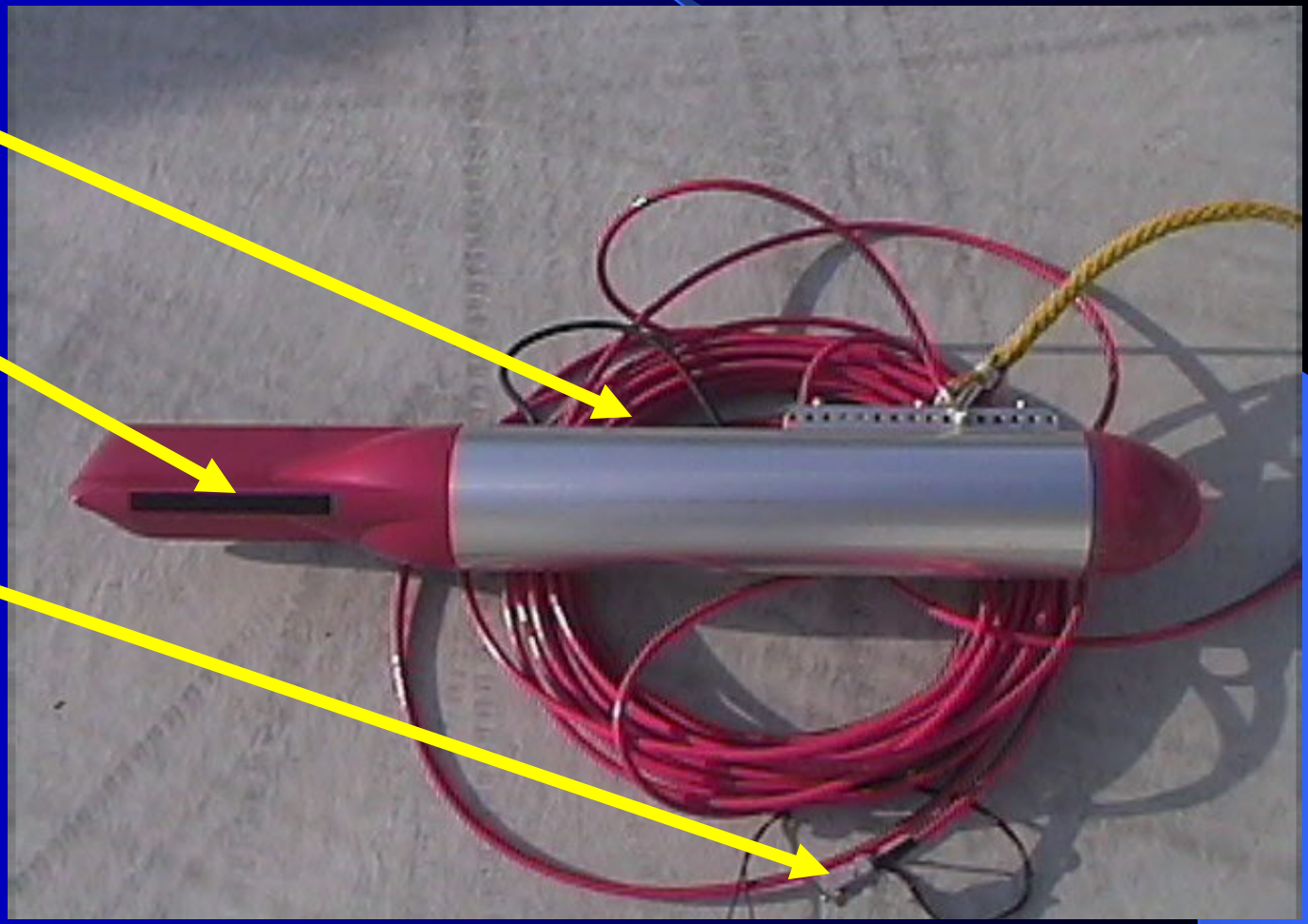
- 330 KHz & 800 KHz
- Capable of diving to 100 Feet
- Shortest swath 50 feet out each side
- Widest swath 400 feet out each side

Side Scan Sonar

Tow Fish

Transducers located in the tail section of the Tow Fish

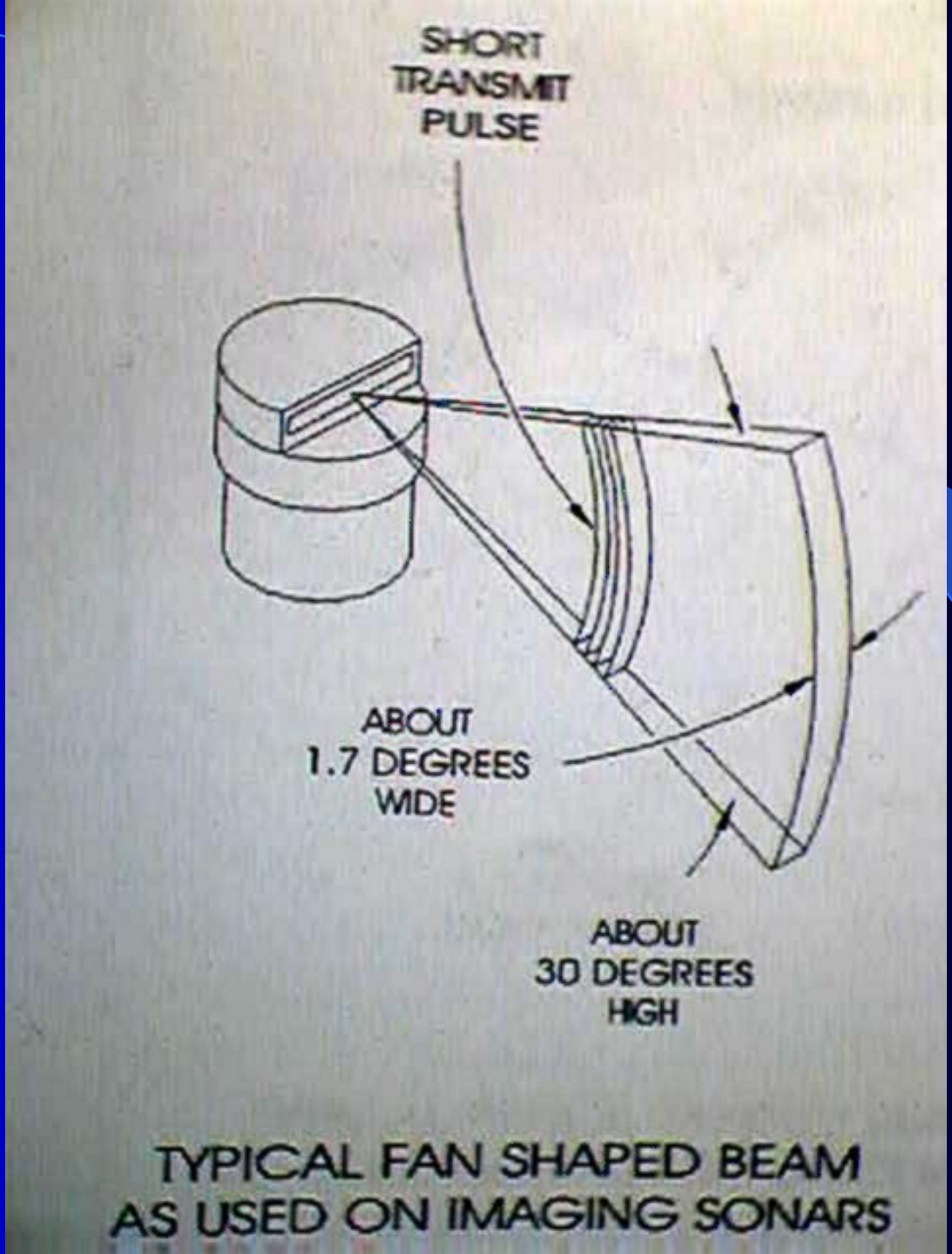
Tow Cable 75 ft
Power supply and RS232 connector to hook into



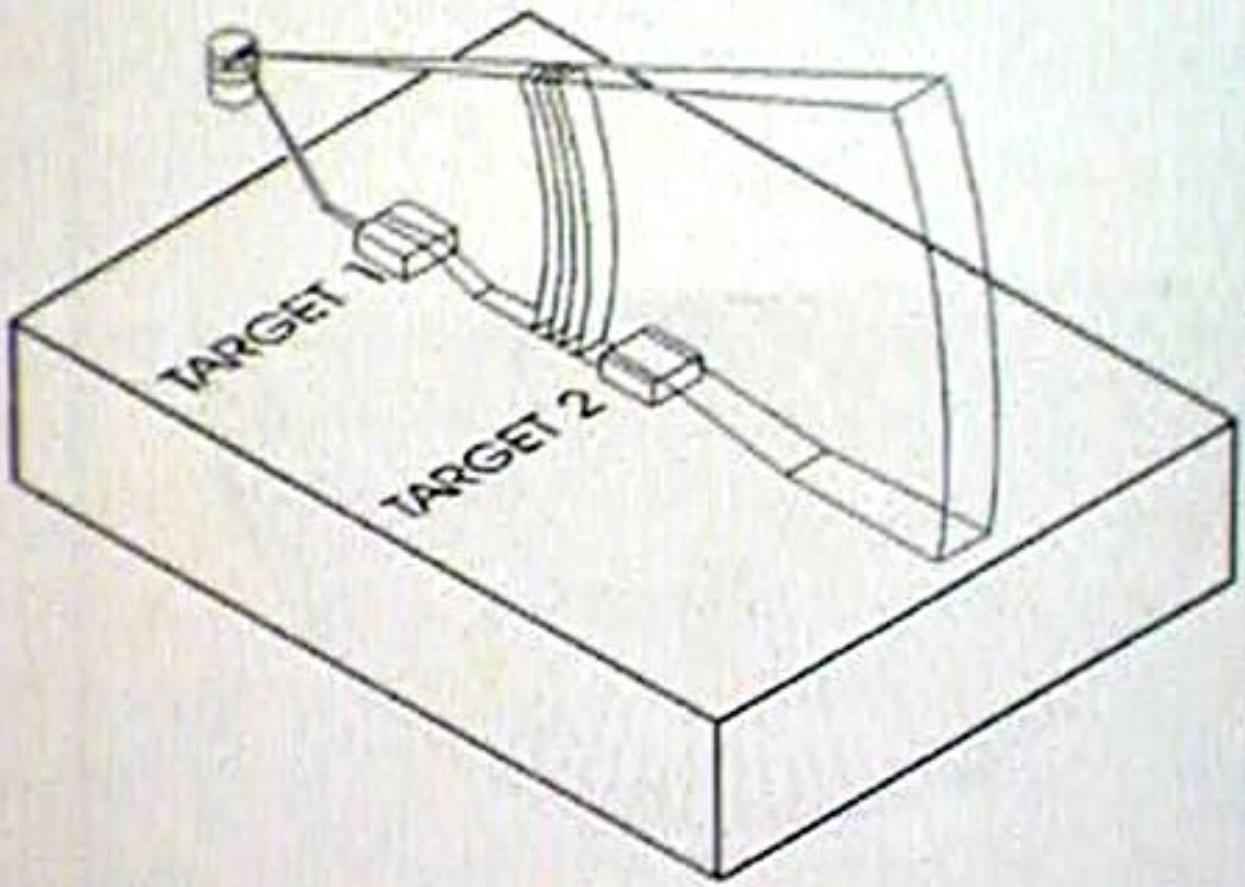
Tow Fish Transducers

How Side Scan Sonar Works

- Sound waves or Pings
- Sound waves travel from transducers
- Some sound waves return at varying strengths
- Hard returns lighter color
- Softer returns or no return darker or black color



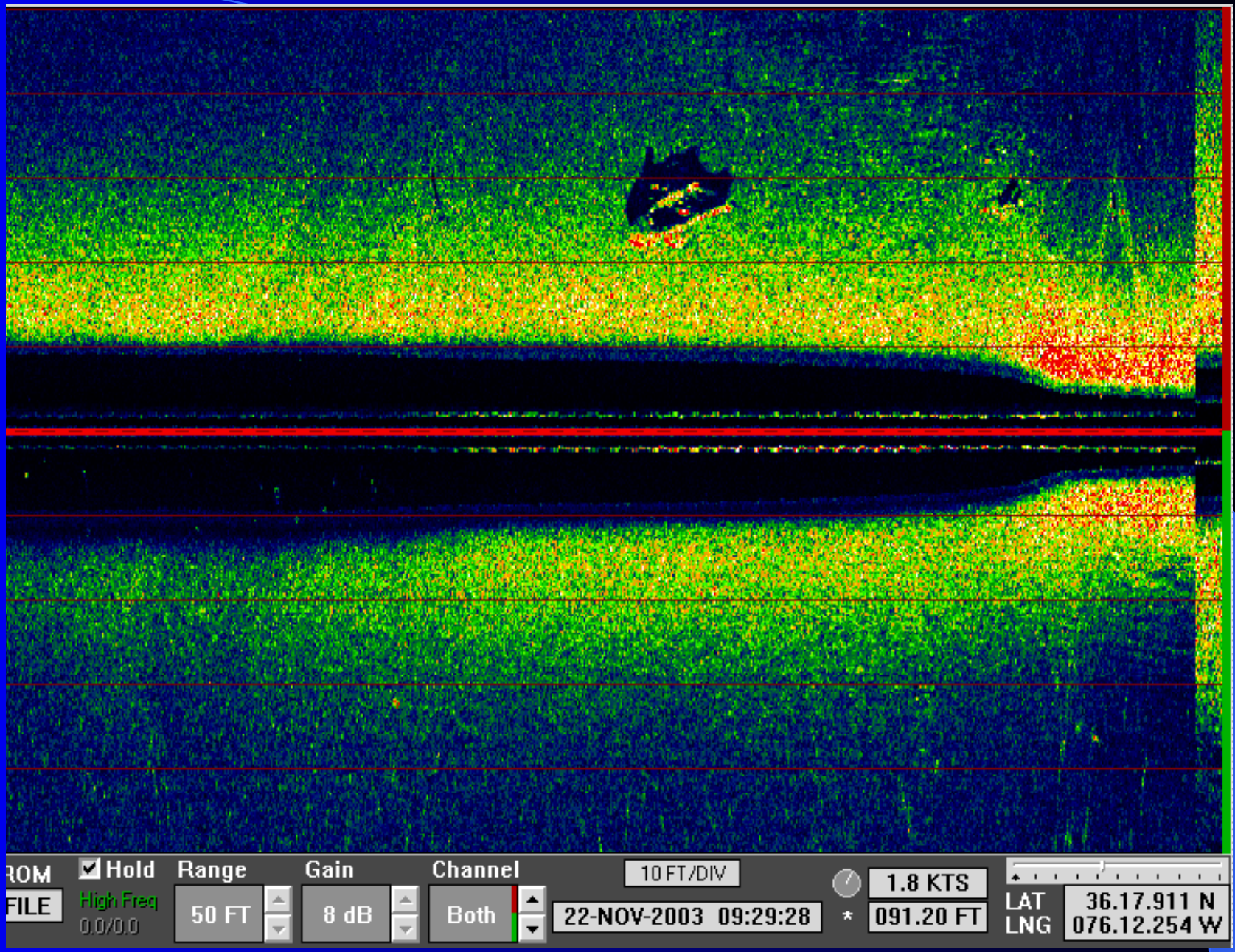
TYPICAL FAN SHAPED BEAM
AS USED ON IMAGING SONARS



FAN SHAPED SONAR BEAM
INTERSECTS WITH A FLAT BOTTOM
AND TARGETS

Data acquisition Software

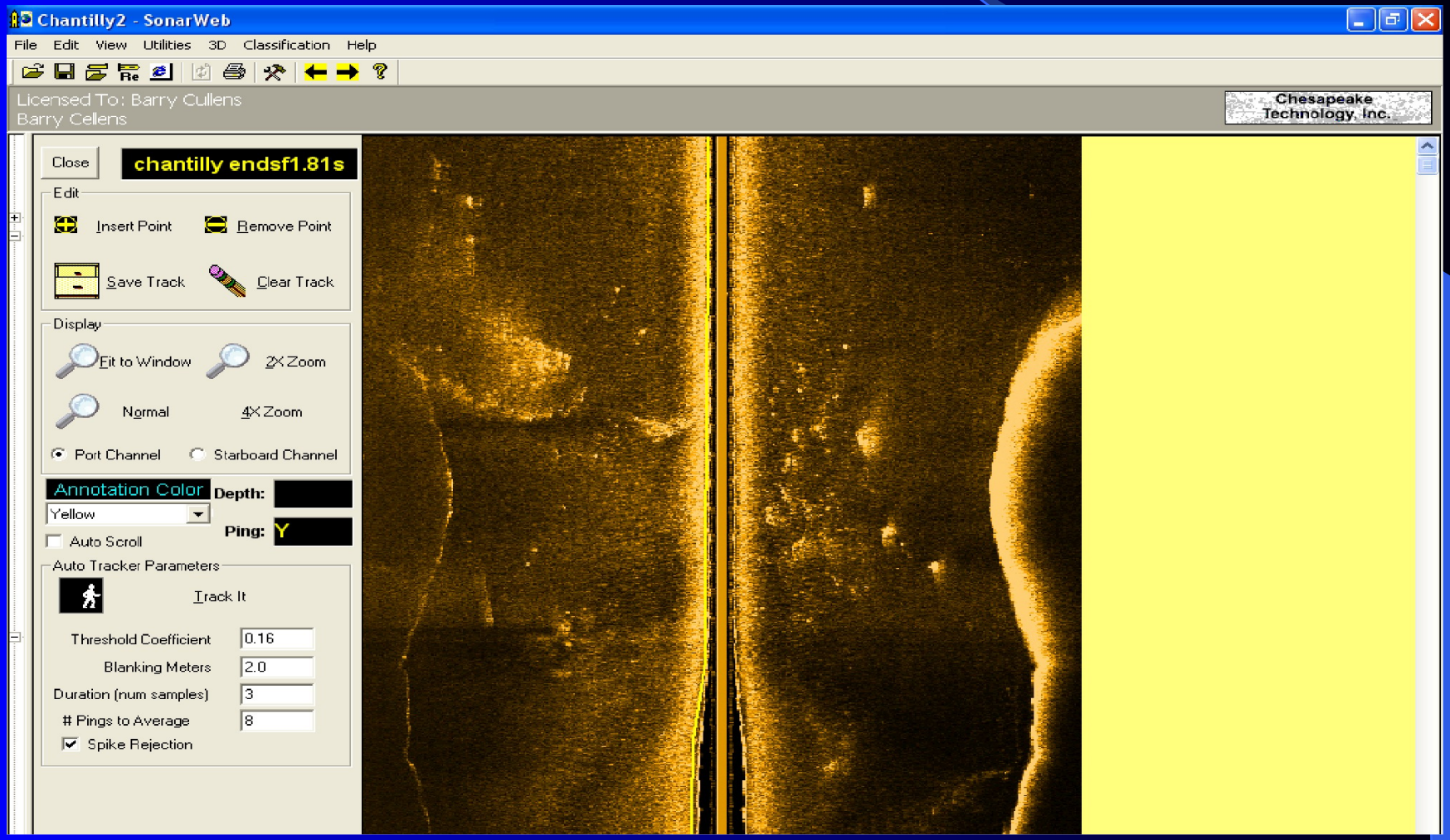
- Collects Sonar data from the Tow Fish
- Collects GPS data (Latitude & Longitude)
- Records all data
- Ability to freeze screen and measure targets.
- Ability to change colors for different views of data.


ROM
FILE
Hold
High Freq
0.0/0.0
Range
50 FT
Gain
8 dB
Channel
Both
10 FT/DIV
22-NOV-2003 09:29:28
1.8 KTS
091.20 FT
LAT
LNG
36.17.911 N
076.12.254 W

Mosaic Software

- Web based mosaic producing software
- Generates near real time mosaics
- Generates analytical reports of acoustic data
- All outputs viewable from web browser
- Beam Angle Correction
- Bottom Tracking produces altitude of Tow Fish and depth measurements for 3D maps
- Navigation Editor
- Curser tracking in UTM & Lat/Long

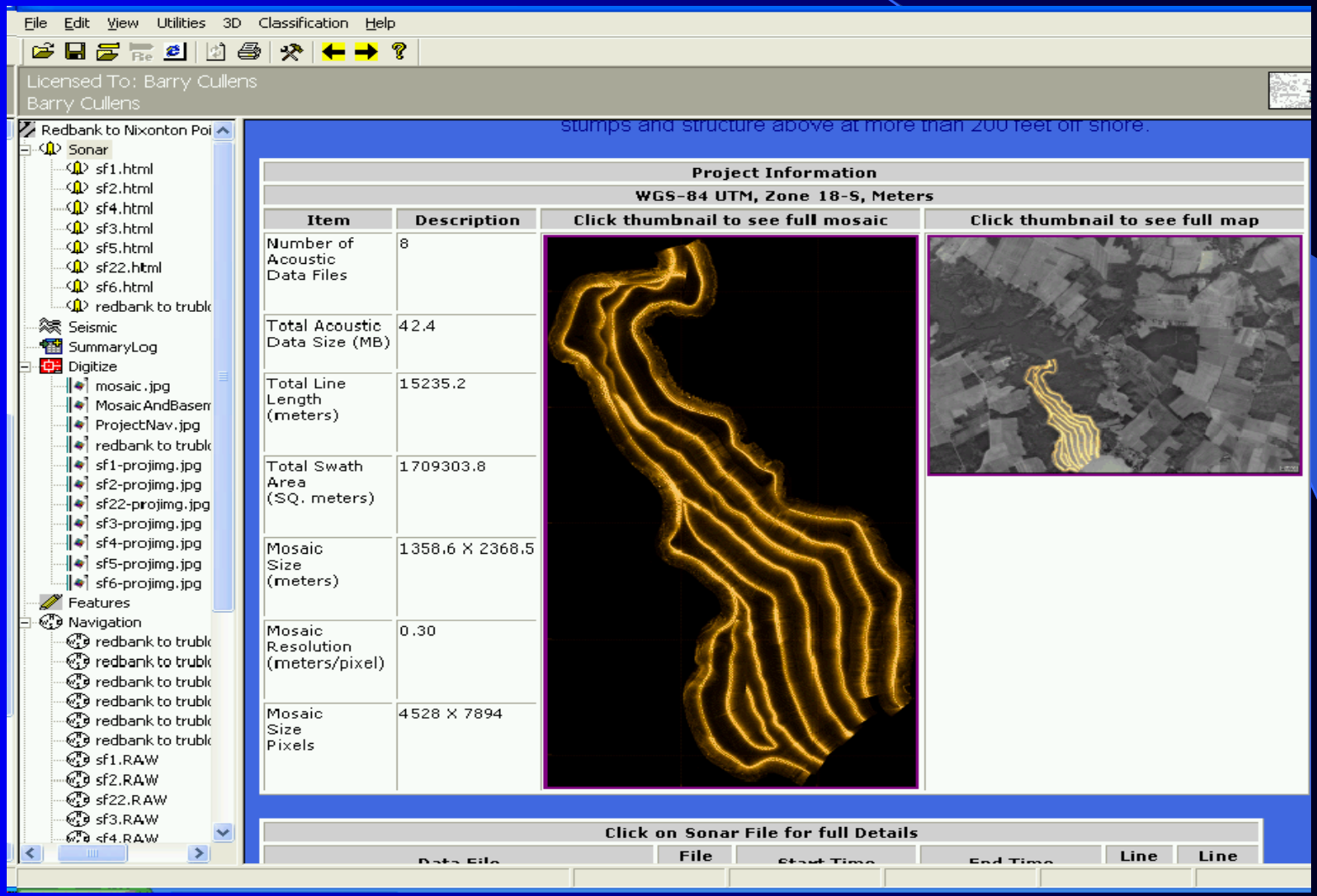
Bottom Tracking for depth measurements



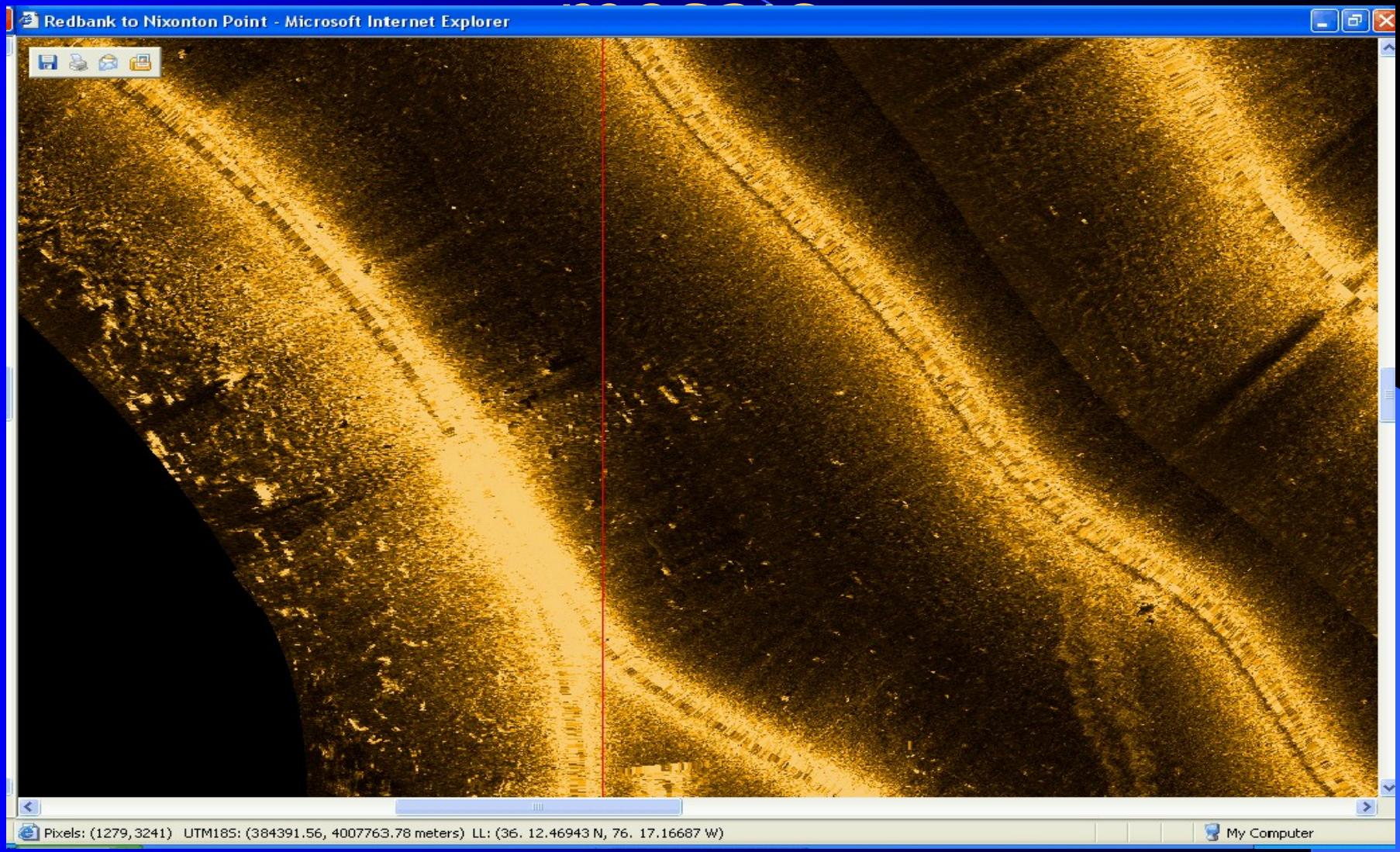
Bottom Tracking to 3D image with depth measurements

- Export navigation files to Excel as Comma Separated Values (CSV files)
- Run Macros in Excel to extract xyz data and change data to feet
- Run extracted data in 3D Contours program within Mosaic software
- Create 3D image using Kriging algorithm to average between sonar swaths

Output to Web Browser

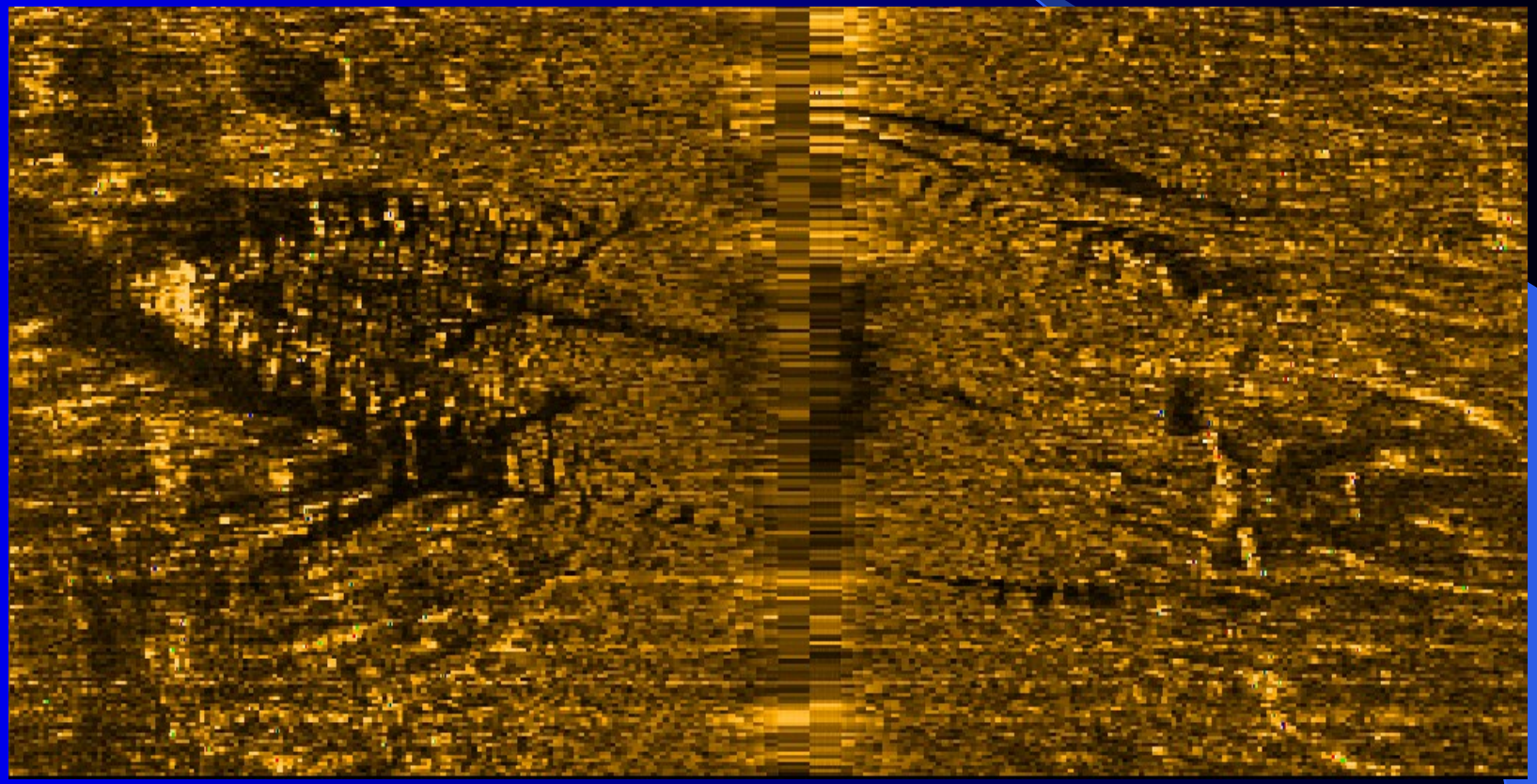


Sonar data transformed into

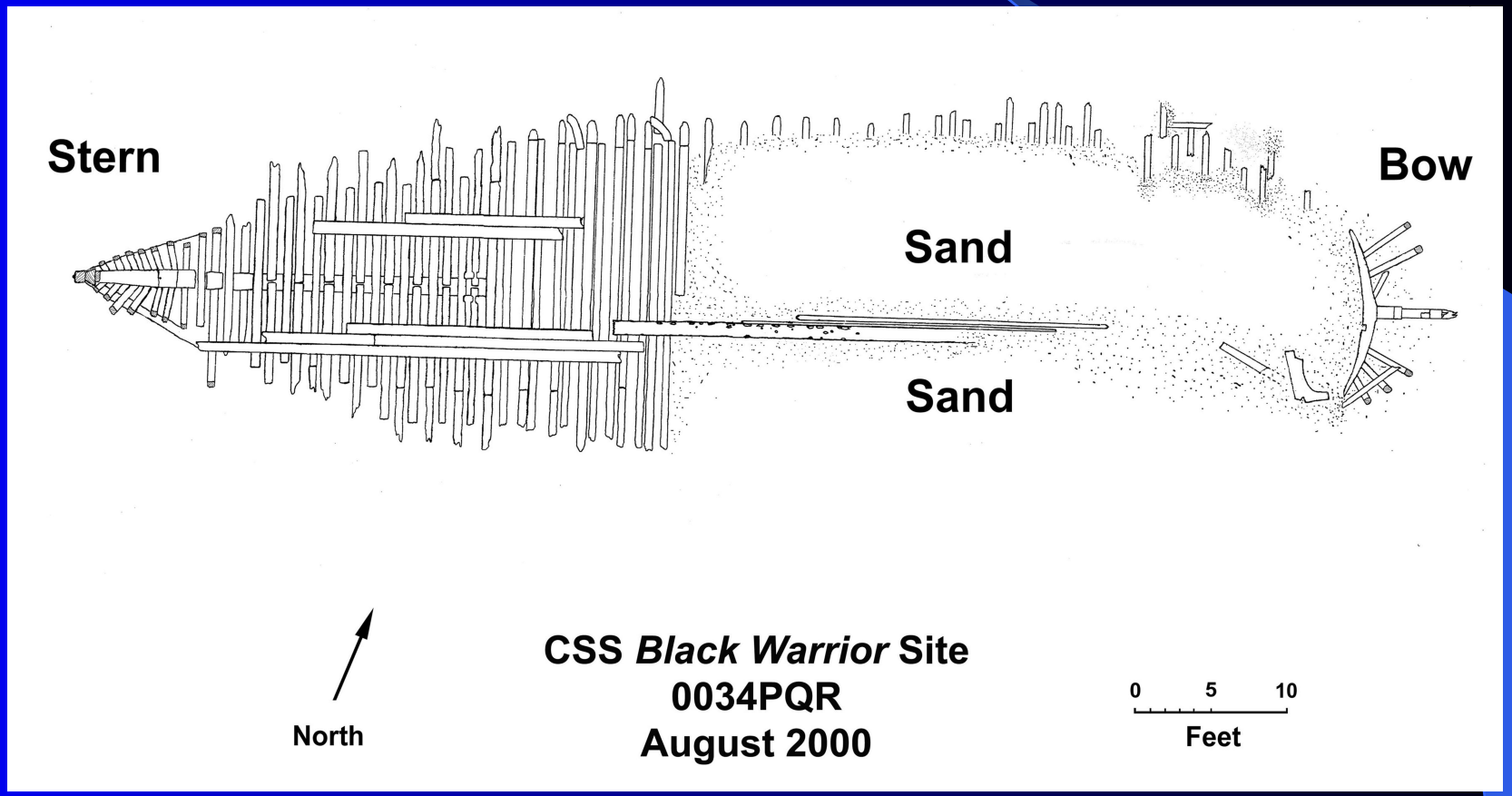

Redbank to Nixonton Point - Microsoft Internet Explorer
Pixels: (1279, 3241) UTM18S: (384391.56, 4007763.78 meters) LL: (36. 12.46943 N, 76. 17.16687 W)
My Computer

Satellite Image with mosaic

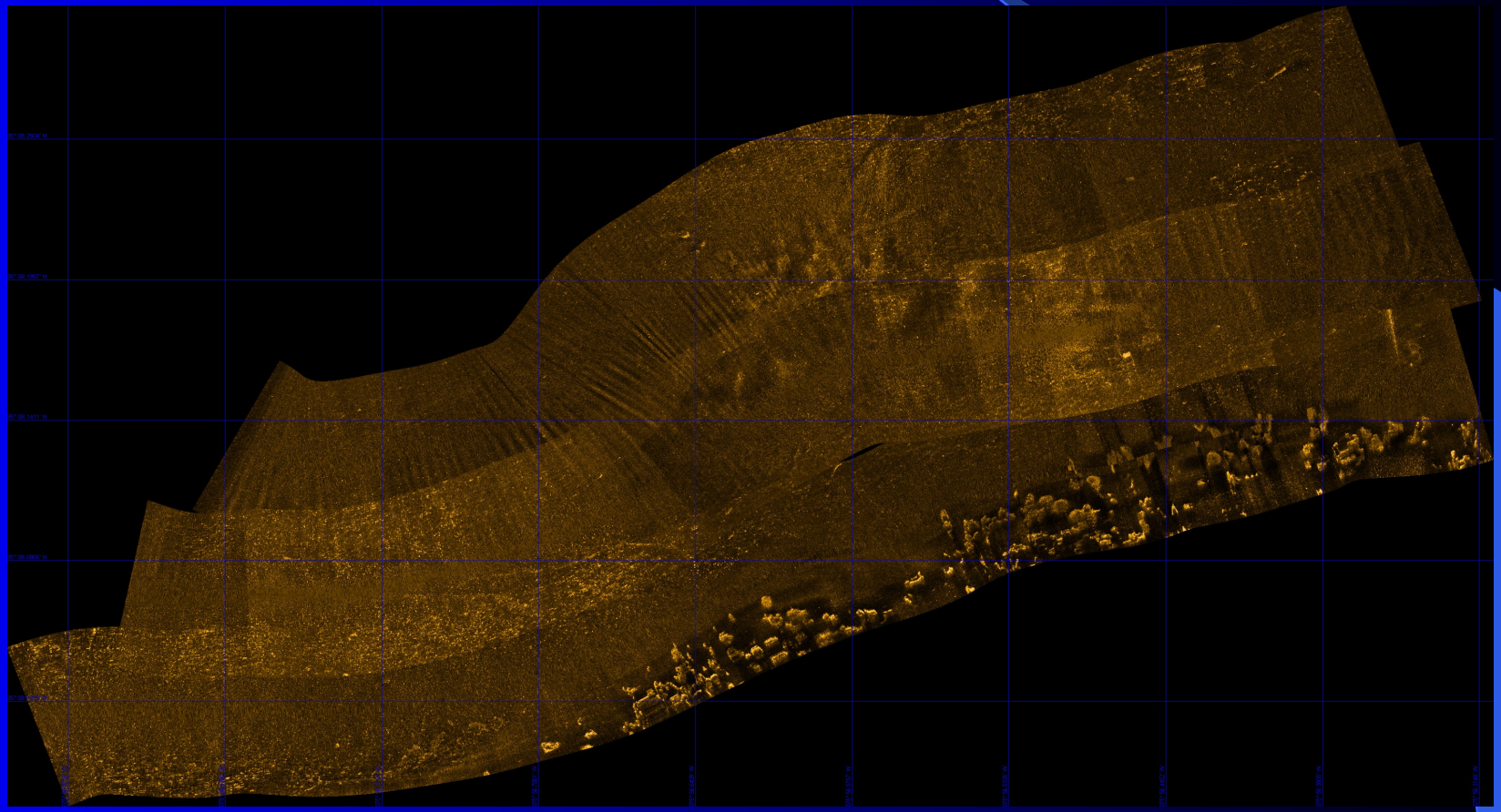
Black Warrior 800 KHz 200 Foot Swath



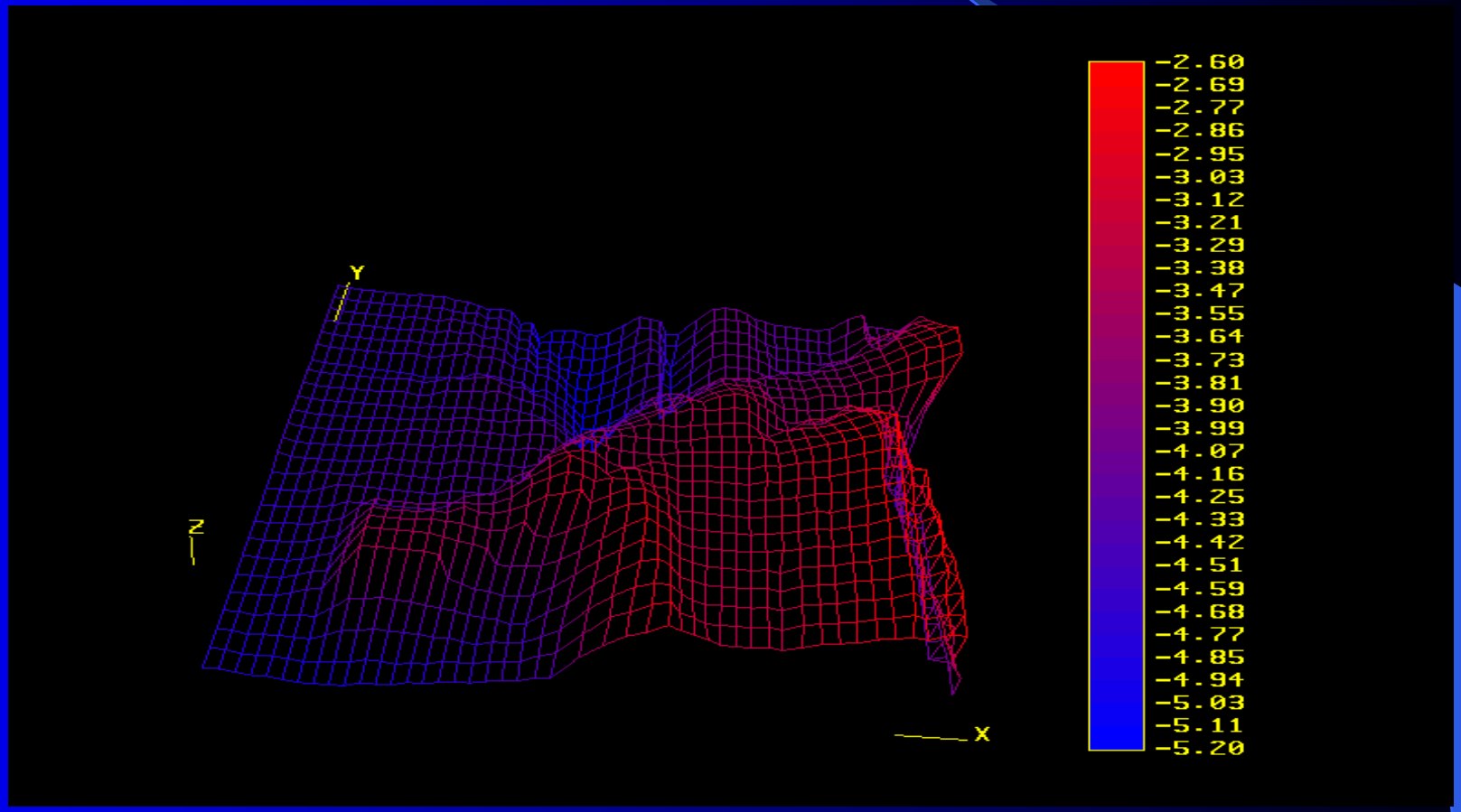
Black Warrior Drawing from NCUA



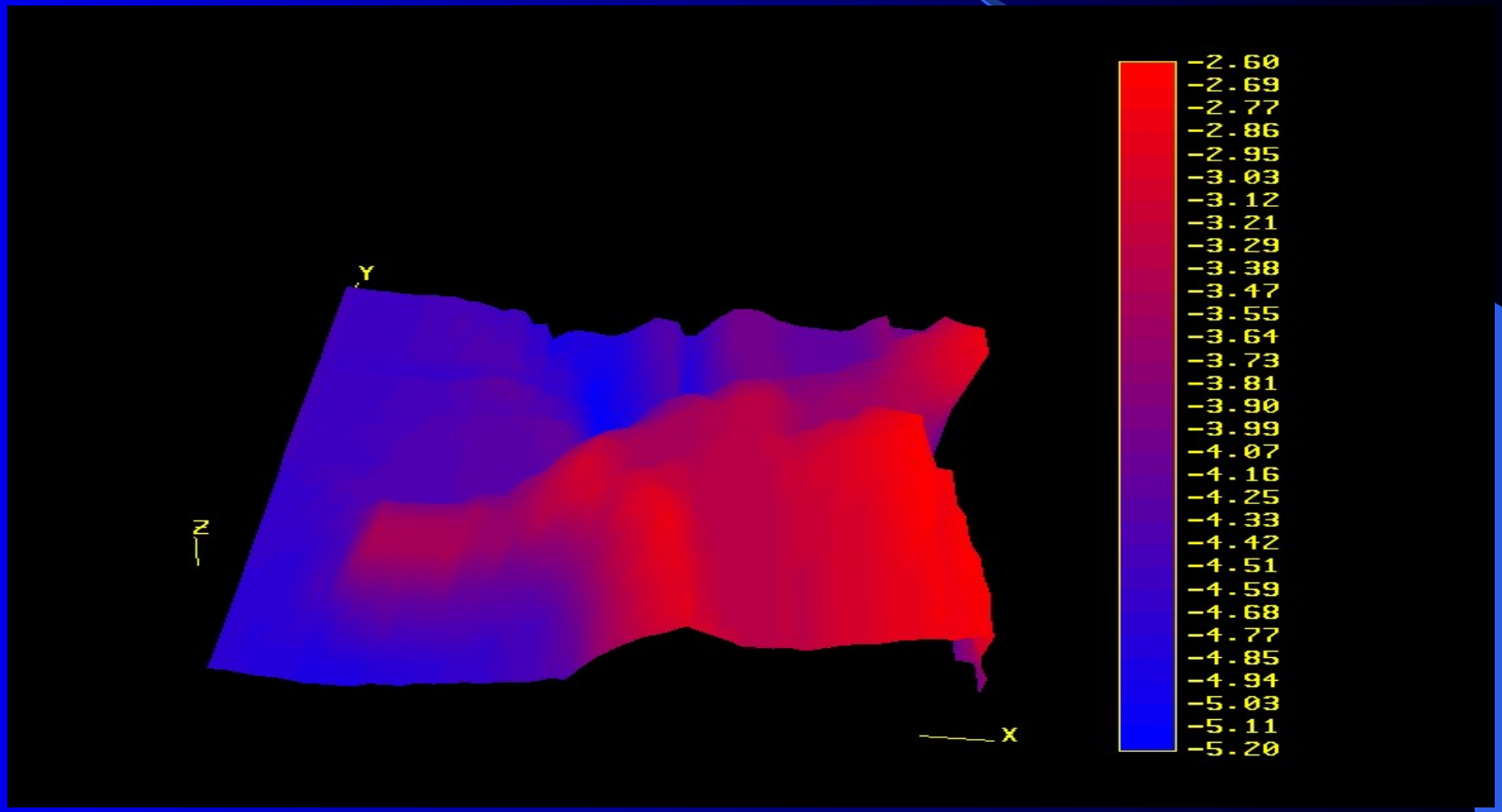
Fishing Shoal Ocracoke Inlet



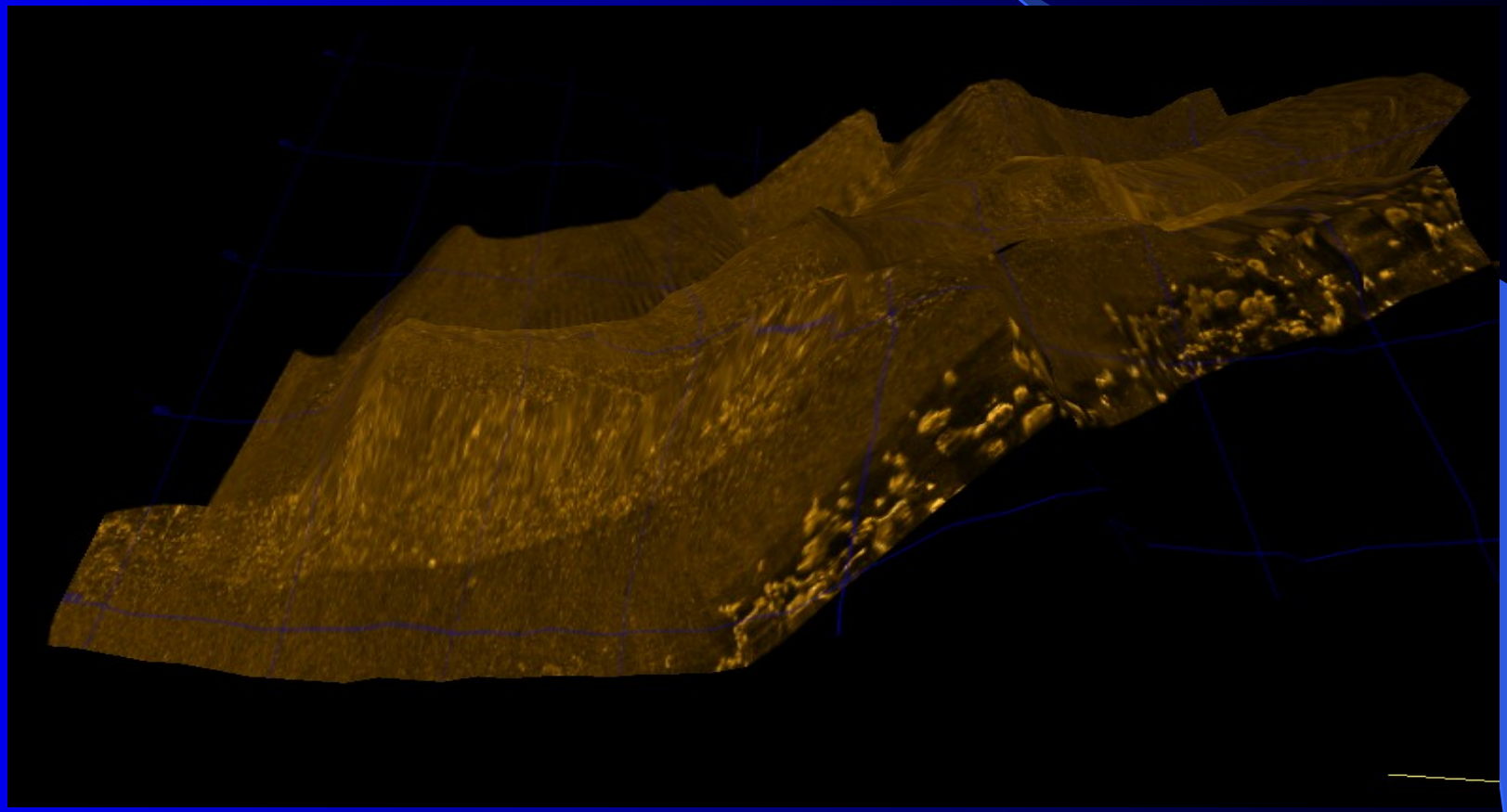
Fishing Shoal 3D Grid



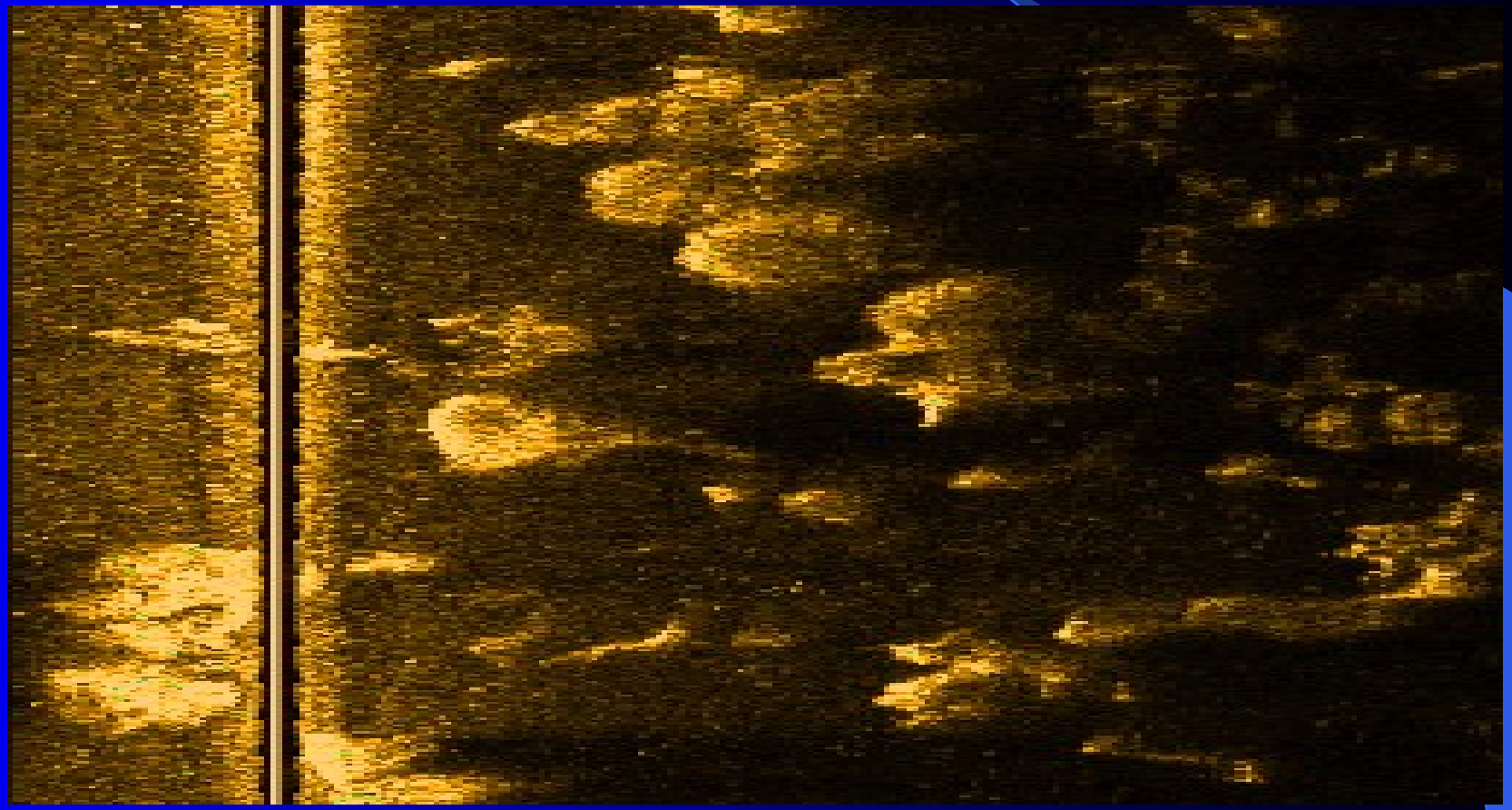
Fishing Shoal 3D Solid



Fishing Shoal Overlay



Shoal Grass Target

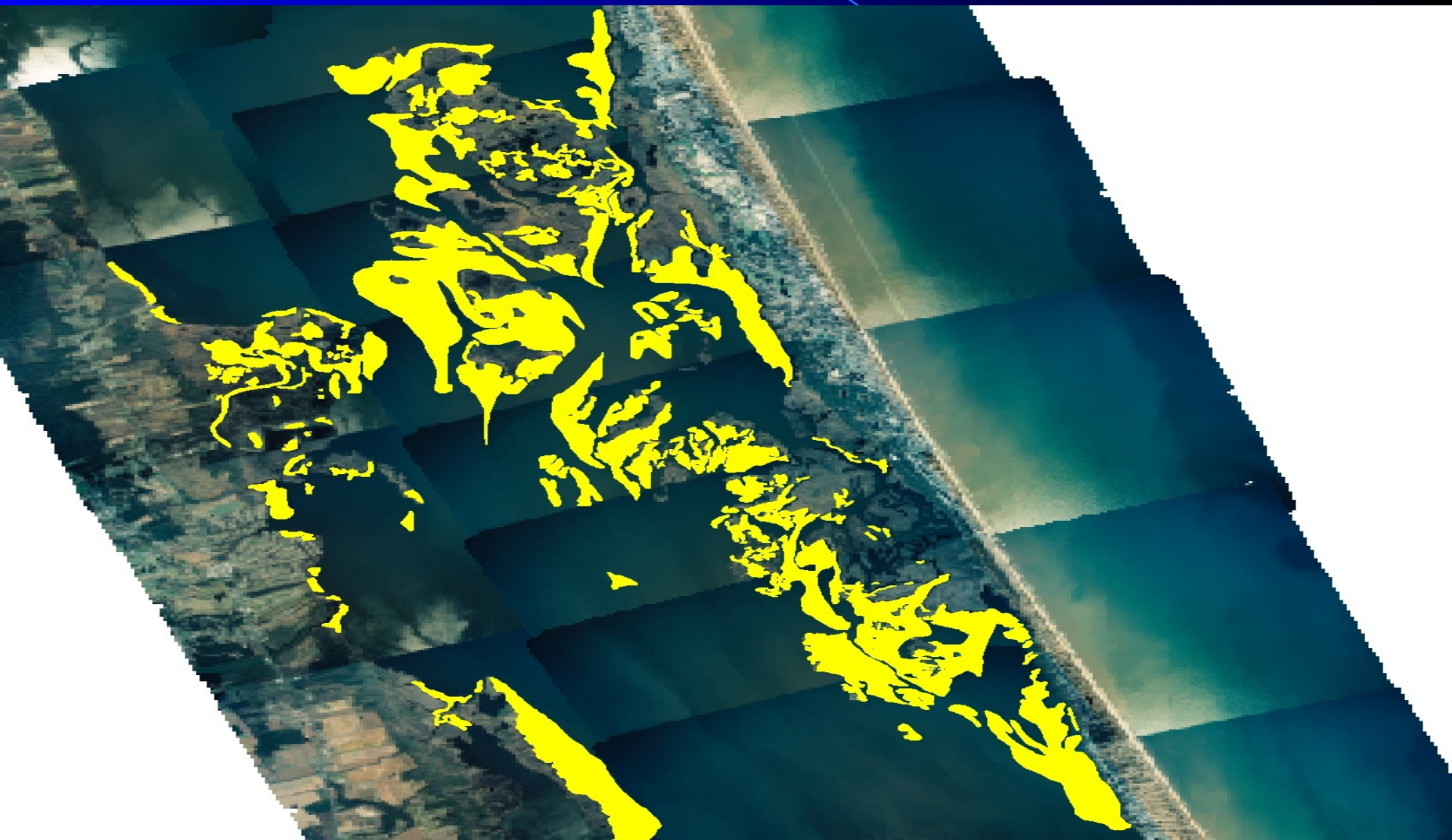


Shoal Grass Target Data

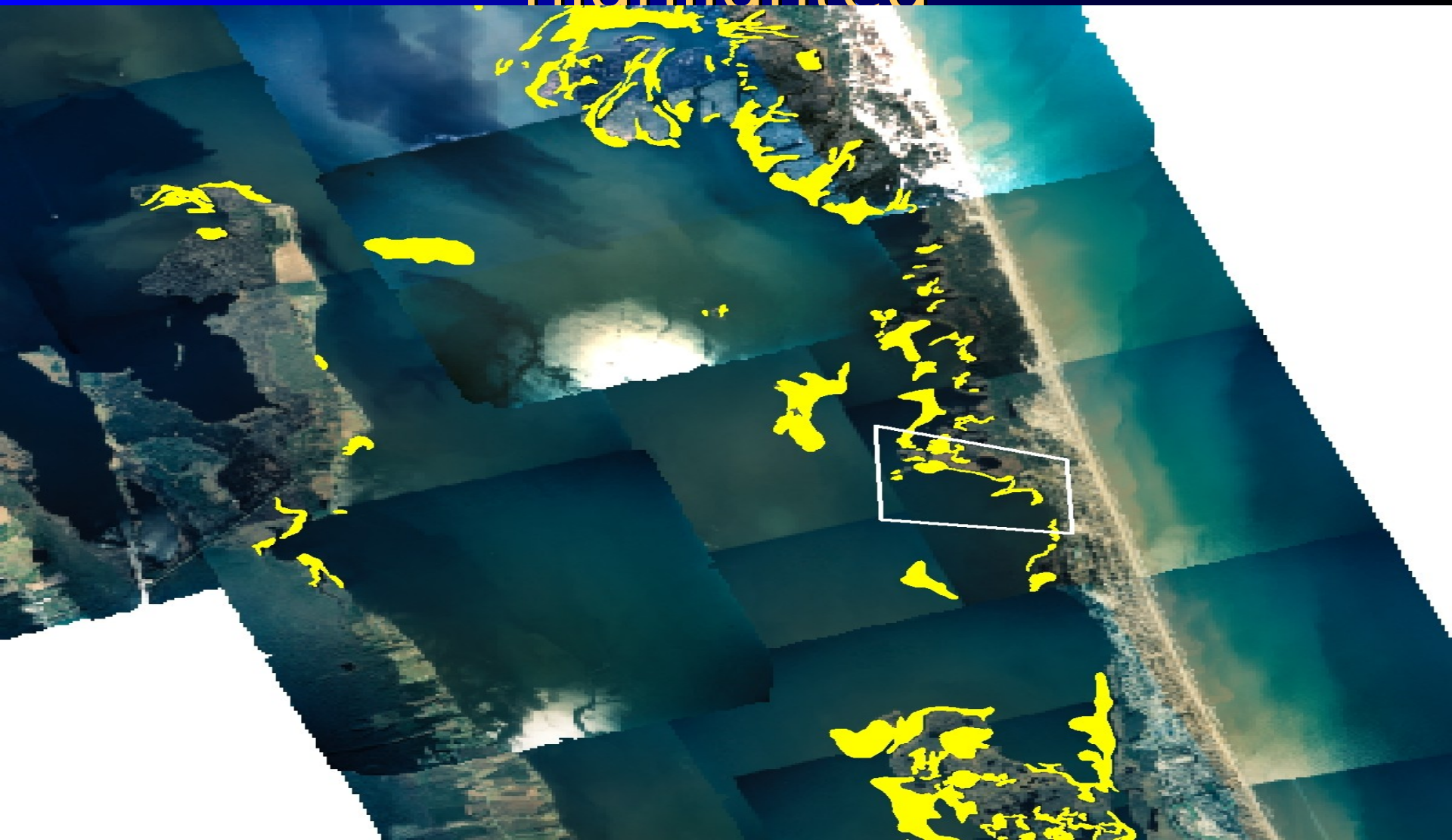
- Original Filename: C:\Fishing Shoal\Target\Shoal Grass.jpg
- Sonar Filename: C:\fishing shoal2.81s
- File Creation Time: 02/26/05 21:36:57
- First Target Ping Num: 3560 at 04/16/2004 12:40:19
- Upper Left Image Corner: 35° 08.1235' N 075° 56.5140' W
- Lower Right Image Corner: 35° 08.1004' N 075° 56.4384' W
- Target Geodetic Position: 35° 08.1120' N 075° 56.4762' W
- Speed at Target: 2.7 kts
- Heading at Target: 78.4 deg
- Course at Target: 78.9 deg
- Towfish Altitude at Target: 3.1 feet

Currituck Banks National Wildlife Refuge and Wild Celery

Mossey Island and South



Whalehead Club area highlighted



Sincock

- Repeat Transects using Side Scan Sonar